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CHATEL-GUYON

Dr. G. H. BRANDT

With the Author's Compliments.

THE

MINERAL THERMAL SPRINGS

AT

CHATEL-GUYON

AUVERGNE

BY

G. H. BRANDT, M.D.

CONSULTING PHYSICIAN AT ROYAT LES BAINS

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THE

MINERAL AND THERMAL SPRINGS

AT

CHATEL-GUYON.

INTRODUCTION.

During my summer residence at Royat les Bains for the last two years, I have occasionally met with cases which from their complicated nature, involving liver, spleen, and kidneys, in a more or less congested condition, required, after the treatment at Royat, an after cure. The proximity of Chatel-Guyon has allowed me on more than one occasion to visit this interesting station, which affords an abundant supply of thermal mineral waters, most valuable in the affections above mentioned. I have, therefore, availed myself of this locality by sending several patients there, and have been surprised at the rapid results obtained.

Although but little known, its success has been

of late so marked that the number of invalids who seek its waters has increased to such an extent that accommodation has been wanting. This year, however, a large Hotel is built, with every comfort that can be wished for.

The bathing establishment is very complete, and well fitted with every arrangement that can be desired. The springs are very abundant, and new springs have been discovered which could supply water to an establishment four or five times the size. I feel confident that when once known a large number of patients will find their way there, and will derive considerable benefit for a class of ailments most distressing, not only from the active local symptoms, but from the mental impressions produced by these symptoms, and by the obstinacy with which they resist our several methods of treatment. The numerous cases of cure I have seen during my visits to Chatel-Guyon, and the decided benefit met with by those few cases which I have hitherto sent there for an after cure from Royat, are, I think, a sufficient apology for bringing before the profession a brief notice of these remarkable springs.

SITUATION AND HISTORY.

THE thermal springs of Chatel-Guyon are situated in a charming and picturesque valley in Auvergne (Department of Puy de Dome) at the foot of a hill surmounted by a cross, where formerly stood the Feudal Chateau of Guy III., duke of Auvergne; it is approached by a splendid road leading to it from the old town of Riom, one of the railway stations on the Paris, Lyons, and Mediterranean line, it lies three miles from Riom, six miles from Clermont Ferrand, and two hours by rail from Vichy. Any one going to Chatel-Guyon should certainly stop at Riom, one of the most interesting towns in Auvergne, formerly it was the rival town of Clermont Ferrand owing to its privileges, liberties, and municipal customs, often confirmed by its Dukes, and by the Kings of France; to this day the courts of Justice at Riom rank higher than those of the head of the department. It has been the birth-place of many celebrated men, chiefly men of the Bar, Historians, and Acade-

micians. The two principal streets, which intersect the town crossways contain many fine specimens of architecture of the 13th century: several houses in the renaissance style, well designed and richly decorated with finely sculptured stone. The most remarkable is the Hôtel des Consuls which may be classed among the historical monuments of France. The Court of Appeal is also a fine building remarkable for the Sainte Chapelle which is attached to it, and which constitutes a perfect gem of the fifteenth century: it was built by the Duke of Berry, and is a fine type of Gothic architecture: its stained glass of the same epoch is perhaps the finest in France. The Sacristie of the Church Saint Amable, half Gothic and half Roman, is remarkable for its sculptures of the Eighteenth Century. Every year, on the Sunday following the 11th of June, the Grande Fête of St. Amable is celebrated with great pomp. The Relics of this Saint are supposed to have the power of curing the insane; on that day the Relic is carried by the inhabitants of the town, dressed in the old costume, in front of the Relic a large wheel formed of flowers is also carried in the procession

and made to revolve constantly; the insane are made to pass under the wheel in order to regain their sound mind. The church of Mathurat is another fine specimen of the primitive ogival style, its entrance is a *Chef d'œuvre* of Gothic sculpture, it contains a fine picture by Müller, "The entrance of Christ into Jerusalem."

Le Pré Madame, a magnificent promenade, with an exquisite view, adds considerably to the beauty of the old town. The scenery from Riom to Chatel-Guyon is superb, and is one of the most pleasant drives in that district; before reaching Chatel-Guyon the traveller cannot avoid stopping on the road to visit the old Chateau de Tournoel, one of the most perfect specimens of mediæval fortresses, with its fortified centres, its portcullis gates, the Chatelaine's oratory, with fresco paintings (Italian school of Fifteenth Century); the old bedchamber with paintings of the same epoch (unfortunately damaged by stupid inscriptions of certain visitors); the Hall of Justice; Monumental Chimneys; the Chapel, Prison and Oubliettes.

Near this the traveller will see the curious and

extensive quarries of Volnic black lava which has supplied the department with stone for all their old and modern buildings; this stone is remarkable for its fineness of grain and durability, the oldest part of the Cathedral at Clermont Ferrand (11th Century) is built of this stone and has its edges as sharp as if cut but a few days ago; the old Abbey of Volnic contained the remains of Saint Austremaine, which history says were carried in the year 764 to the Abbey of Morat by the King Pepin himself, bearing the body on his shoulders.

SPRINGS AT CHATEL-GUYON.

THE springs at Chatel-Guyon which may justly be called the Kissingen of France are very numerous. The mineral water oozes out in several places, until lately the small springs which bubbled up in the bed of the river Sardou rendered its waters impotable, obliging the inhabitants to go to Riom to fetch their drinking supply: an aqueduct of recent date brings drinking water direct from the mountain. The amount of carbonic acid gas which escapes from the earth in every direction is unpleasantly felt in that part of the building where the heating apparatus is established; the heat of the gas is soon felt through thick-soled boots.

Monsieur Taurnaire, a mining engineer of repute, has tabulated thirteen different springs giving a sum total of 702,720 quarts of mineral water in the twenty-four hours. I shall, however, only call attention to the principal spring analysed by Dr. Magnier de la Saurce at the laboratory of the

Paris School of Medicine. This analysis shows that these waters may be classified as gaseous, sodic, and magnesian chlorides, mixed, bicarbonated and ferruginous.

CHEMICAL COMPOSITION.

Analysis of a litre (quart) of Mineral water. Temperature at the Spring 95° *Fah.*

Carbonic acid gas, free . . .	1·1120
Chloride of Magnesium. . . .	1·5630
Chloride of Sodium	1·6330
Bicarbonate of Lime	2·1769
Bicarbonate of Soda	0·9550
Bicarbonate of Iron	0·0685
Bicarbonate of Potash	0·2538
Bicarbonate of Lithia	0·0194
Sulphate of Lime.	0·4990
Silica	0·1108
Boric acid	Traces
Phosphoric acid	Traces
Alumina	Traces
Arsenic	Traces
TOTAL	8·3914

These waters are forced through the earth. At

the time of their eruption at the surface, a considerable amount of carbonic acid gas is emitted, varying in quantity in some of the springs, according probably to the effect of atmospheric pressure. All these waters at the time of their exit are colourless and limpid; after a short time of exposure to the atmosphere they become slightly turbid, and the surface gets covered with a small pellicle of lime; they all deposit a red oxide of iron. They have hardly any odour, though Monsieur Lefort has recognised in almost all the mineral waters of Auvergne a slight bituminous odour, which he attributes to their volcanic origin. Their taste is slightly salt and acidulated, leaving a styptic after-taste. If drunk at the spring the saline taste is marked by the carbonic acid gas, but if allowed to stand for a short time the gas escapes, and the saline taste reappears; after two or three days the styptic taste entirely ceases. Many of the patients at first dislike the waters, but after a few days they take to them without the least repugnance. The temperature of these waters is at the beginning of the cure rather repulsive to those who drink them, but they soon get accustomed to it,

and after a few days prefer the warm to the colder waters. When kept in closed vessels these waters deposit their iron with a small quantity of carbonate of lime and magnesia. When evaporated to dryness the result is a perfectly white powder which when super-heated becomes slightly yellow and throws off an odour of organic matter somewhat like bitumen.

Monsieur Lecoq, whilst superintending the digging works for the foundation of a new hotel was surprised to find a large closed cavity lined with crystals of Aragonite, these crystals were covered with a small coating of condensed organic matter already solidified, presenting the appearance of gelatine. When the gelatinous-looking substance was placed in distilled water and left there for twelve hours no trace of infusoria was found.

The discovery of these waters on each side of the rivulet Sardou was determined by the rupture of the primary sediment; they emerge at the point of junction of the primary and tertiary deposits; they may, therefore, be considered as emerging from the primary deposits.

THERAPEUTIC ACTION.

When we examine chemically a mineral water, we can generally in a vague way judge of its action on living organisms, the diseases to which it can be applied, and the effects that may be anticipated from its use. Some waters are characterised by the presence of a large percentage of certain mineral principles which enables us to classify them at once; others on the contrary, are mineralised in such a way that they may be classified in two different manners, this happens to the Chatel-Guyon waters which some hydrologists class as Sodic Chlorides and Chalybeate, whilst others, like Monsieur Lefort, classify them as mixed Bicarbonates. This, however, is a chemical question which is of little value compared with the more important question of their physiological and therapeutic action, for whatever class they belong to in a chemical sense their physiological action is well defined and they must be considered as natural laxative waters. Their aperient action cannot be

accounted for merely by their chemical composition, for although they contain salts of magnesia and soda which amount altogether to about one drachm per quart, we find that two or three glasses, and in some cases only one will produce a free evacuation of the bowels, it is, therefore, natural to seek other causes to account for this action.

These waters which bubble up through the surface of the earth, forced up from the original laboratory at a considerable distance from us, are mineralised at a certain pressure, at a certain temperature, and under certain electrical conditions which give them that power of action which chemical analysis cannot account for, and which defies our keenest investigations. There, however, they are, active, sparkling, living in fact, ready to do their work when called upon to do so, and when judiciously employed render important services to suffering mankind.

The purgative effect of these waters is produced by an excitation of the intestinal mucous membrane, this is followed by folicular and glandular secretion acting at the same time with an increased peristaltic action; this action is almost constantly

varying in time according to the subject. After the injestion of three or four glasses of this water the patient feels a slight intestinal gurgling followed by an abundant bilious discharge. Although the peristaltic action of the bowels is rapid, it is neither preceded nor accompanied by griping or pain; the stomach feels no inconvenience from the use of these waters, except in some cases in which patients have taken upon themselves to drink large quantities at too short an interval; in some obstinate cases the laxative effect is not produced the first day, but when the effect is once produced it continues uninterruptedly without pain, or any unpleasant sensation, whilst the purging continues. The Chatel-Guyon waters are not only purgative, they act also on the renal secretion, and on the sudoriparous glands; these effects may occur simultaneously, but the purgative action predominates. When this action is retarded it is generally replaced by abundant perspiration, and an excess in the urinary secretion: in these cases constipation will generally result. Attentive observation shows that the injestion of this mineral water increases the functional activity of three great organs of

elimination and absorption. The muscular contractility being stimulated increases peristaltic energy. The organs of absorption thus disgorged redeem their functions and enter into a new life. It is as well to mention that an immoderate use of these waters will produce unpleasant effects, such as vomiting, cramp in the stomach, vertigo, and syncope; in fact symptoms of indigestion. One case is on record, in which a man died of gastro-enteritis after drinking *thirty glasses* of these waters in one day. The internal effect of these waters is considerably assisted by the action of the baths. From the large amount of carbonic acid gas they contain, the skin becomes covered with globules of gas, which burst after a short time and are replaced by others: the effect is most stimulating, and at the same time pleasant, so much so that the patients at Chatel-Guyon call it their champagne bath. This general counter-irritation over the whole surface of the skin stimulates the nerves, assists considerably in decongestionising the internal organs, and promotes the removal of a certain amount of waste product. The result of these different actions of the waters

taken internally, and applied externally is, regular action of the bowels, internal secretions restored to their normal condition, cessation of hæmorrhoidal troubles, clean tongue and stomach, healthy digestion, proper assimilation of food, free circulation throughout the system, dissappearance of headaches, dulness, and melancholia, and a restoration of all vital processes.

DISEASES TREATED AT CHATEL-GUYON.

THE affections which derive most benefit from these waters are habitual constipation, intestinal congestion, engorgement of mesenteric ganglia, congested liver, biliary calculi, uterine catarrh, etc., and in all cases of *chronic* congested abdominal organs. The primary action being established, it is easy to conceive how it affects distant organs, which suffer from the effects of the first, viz., tendencies to cerebral congestion, old apoplectic foci, consecutive paralysis, and obesity.

2. Owing to their tonic and laxative properties, they are very useful in cases of dyspepsia, and particularly in that distressing form flatulent dyspepsia, also in cases of leucorrhœa, dysmenorrhœa, and amenorrhœa.

3. Owing to some observations made by Professor Gubler, these waters have produced marked effects in some cases of Bright's disease, and diabetes.

I must observe here, that the treatment does

not consist in purging the patient by making him drink large quantities of this warm mineral water, as is done with the bitter waters so much in vogue at present. It is by a methodical and progressive application of small doses, in order to obtain the re-establishment of the perverted intestinal function, that good results are to be obtained. The temperature of these waters is an important factor, not only for the internal treatment, but for bathing purposes; a superiority it certainly possesses over the waters of Kissingen, for these are superheated, an operation which must necessarily alter their chemical composition by disaggregating their atomic principles.

In very obstinate cases of constipation, a good auxiliary to the internal use of the waters consists in administering an ascending douche of the same mineral water; its stimulating effect on the large intestine soon produces a good effect.

DIFFERENT KINDS OF BATHS.

THE still bath, as its name implies, consists in stopping the flow of water when the bath is full.

The constant-current bath, where the water is kept running through the bath all the time the patient is in the water.

The acidulated bath, is a constant current bath, with water flowing directly from the spring before it enters into the reservoirs. This bath contains a much larger quantity of carbonic acid gas than the others.

The piscine bath is also a constant current bath of large dimensions, in which several people can bathe at the same time, and in which walking and swimming exercise can be taken.

The ascending local douche, either vaginal or rectal, is taken with mineral water of the same temperature as the spring.

The general douche and foot bath is generally taken with super-heated water, the composition of the water in these last cases is of slight importance, as they only act by their temperature, the force of pressure and the stimulating effect on the skin.

DURATION OF TREATMENT.

This question entirely depends on the ailment, whether of old standing, complicated, or simple; and also on the particular temperament and idiosyncrasy of the individual. In simple cases of constipation, produced either by the use of other mineral waters, or from any other cause, a fortnight is often sufficient for a cure; in obstinate cases of a chronic character, with complications in other organs, a longer time is necessary, few, however, have to stay over the 25th or 30th day.

The best time for a course of treatment at Chatel-Guyon varies much. Many patients delight in the warm weather of July and August, whereas others prefer the cool temperature of June and September. From a long experience in the use of mineral waters in different parts of Europe, I find, as a rule, that warm weather suits the generality of patients better than cold. Moreover, I believe a free perspiration is valuable in aiding the treatment of disease by mineral waters.

COUNTER-INDICATIONS.

It is fair to all parties to show any faults if there are any, and to warn those who intend following a cure, of anything to be avoided. During a mineral-water cure, there are certain rules to be followed, some of which are common to all mineral waters, and others which are peculiar to a particular water; such is the case with Chatel-Guyon, and it is just, that I should say a few words on that subject.

The Chatel-Guyon waters are chiefly to be employed in chronic cases; should any acute symptoms be present, the exciting action of the mineral water may set up inflammatory symptoms, which would be prejudicial to the patient.

These waters act, rather on the function than on the organs themselves, and if they act by disgorging certain viscera, it is by exciting the phenomena of resorption and elimination. These waters are also counter indicated when there is alteration or degeneration of tissues, and when

a diathesis exists, not yet manifested by any organic disorder, but which might spring up by too much stimulation; cases of cardiac affections in which there is abstracted circulation, should avoid these waters; the pregnant state is a formal counter indication, and women during the menstrual period should abstain from them.

A piece of advice, which cannot be too often repeated, is, that mineral waters are not to be trifled with; they are all more or less powerful agents, and if they do not do good, they may do harm if not judiciously employed. I have seen most baneful effects arise from the incautious use of some of the most simple mineral waters. I intend referring to this important subject on some future occasion.

It is usual, as at most mineral springs, to repeat the treatment for two or three seasons, for, however potent the remedy may be, it is hardly possible to expect a radical cure in the short space of time allotted to each treatment.

PHYSIOLOGICAL EXPERIMENTS.

REFERRING to the very accurate analyses of these waters made, and repeated by several eminent chemists, one sees that the chief mineral agent is chloride of magnesium, which constitutes its active principle, associated in its action by chloride of sodium and other alkaline salts.

The physiological action of chloride of magnesium is but little known, and has, therefore, elicited a particular study, which was carried out in 1879 at the Laboratory of the Ecole Pratique, in Paris.

The result of these experiments having attracted considerable attention, I think it will be interesting to the English medical practitioner to see a *résumé* of the work done, and the conclusions arrived at. The experiments were carried out on different animals, chiefly dogs, by introducing the mineral water into the stomach, as also by intravenous injections of chloride of magnesium. It would be out of place, in a small work of this

description, to describe all the processes and observations made; I shall, therefore, limit myself to give the conclusions arrived at and presented in a memoir to the Biological Society of Paris.

The first experiments were made with the mineral water as taken from the spring.

Secondly, with the same water reduced to its soluble principle.

Thirdly, with analogous substances made in the laboratory.

Fourthly, with the salt alone, chloride of magnesium.

The result of the first experiment was a marked diuretic and slight aperient action; during this experiment, the animal, a dog, suffering at the time from conjunctivitis, was cured in 7 days; this observation seems to justify the confidence the poor people have in this water for curing eye diseases; increasing the dose of the mineral water the effects were also increased. The conclusions of this experiment were, that with a small dose it is diuretic, with a double dose it is laxative, and with a treble dose purgative.

Second experiment—1st mineral water reduced

from one quart to an ounce introduced into the stomach, produced marked purgation, but not very intense. Secondly, 35 grammes (a little over an ounce), injected into the femoral vein, produced an increase of the pulse, 140 pulsations lasting 10 minutes, after which it became normal, 72; two hours after the injection the animal micturated copiously,—had an abundant evacuation. During the following twenty-four hours the dog had several dry evacuations, as before the experiment.

Thirdly: The experiments made with the salts prepared in the laboratory, produced the same results.

Fourthly: Experiments made with the chloride of magnesium alone. Two hours after the administration of 2½ grammes (38 grains English) of this salt, an abundant and soft evacuation took place, accompanied by copious diuresis.

The experimenter took, himself, 2 grammes (30 grains) of the salt, and was gently purged without pain or any malaise.

The experimenters conclude, after repeated experiments, that the mineral waters of Chatel-Guyon are diuretic, aperient, and laxative, and that they

owe their properties to the presence of chloride of magnesium, which exists in these waters in the proportion of one gramme and a half to the litre, or 30 grains to the quart.

Another series of experiments undertaken by other physiologists have confirmed the above statements, and go further to prove that these waters have a marked action on the biliary secretion, increasing it considerably. It also acts on the heart, increasing muscular contractility,—on the blood, by increasing and prolonging its red colour and rubiginous appearance for a considerable time after death, as if under the influence of super-oxygenation. The microscopic examination revealed nothing appreciable in the appearance of the figured elements of the blood; muscular contractility was exaggerated and continued long after death. The respiratory organs feel the influence of this drug when injected into the veins, it causes accelerated breathing and irregular dyspnœa, and it may, according to the quantity injected, produce temporary asphyxia, and even permanent arrest of the respiration.

On the nervous system slight anæsthesia and tendency to somnolence result.

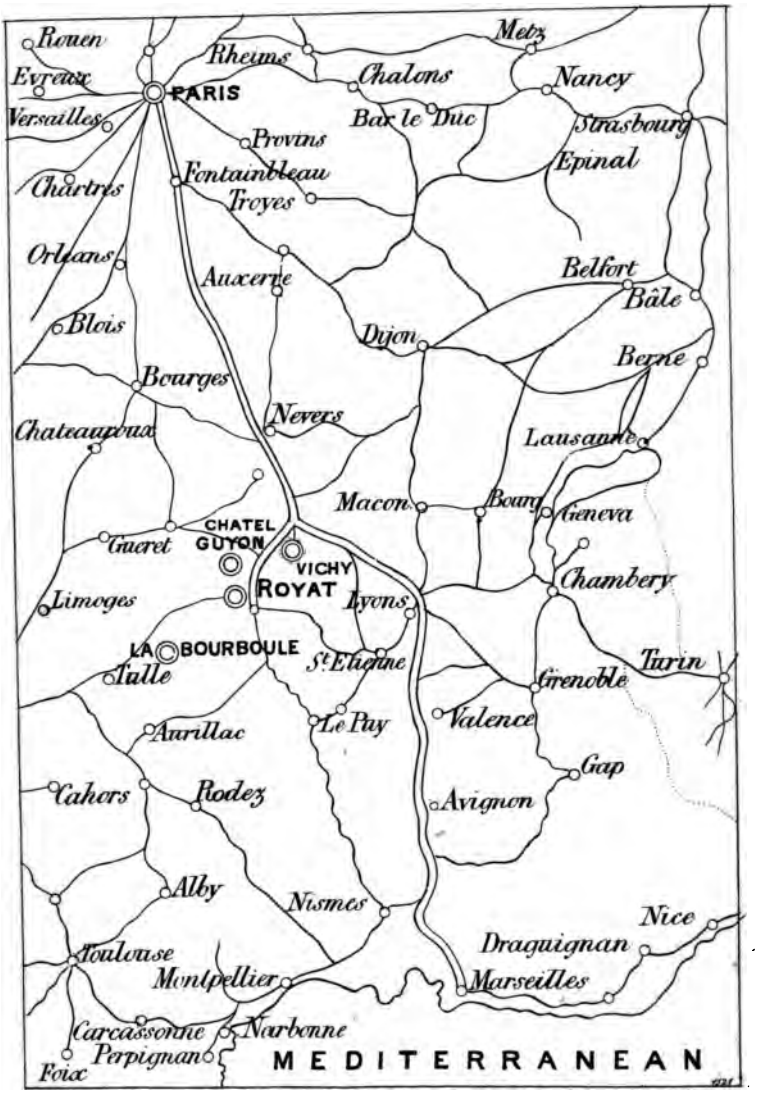
CLIMATE.

The climate of Chatel-Guyon is pretty much the same as in all the valleys in Auvergne. Hot during the middle of the day, cool and pleasant in the early morning and evening. The soil is dry, and the air very pure. The surrounding woods offer many pretty walks, both pleasant and useful to the patient under treatment.

AMUSEMENTS.

Like every watering place in France, Chatel-Guyon has its Casino, its Park, and a band of music. These are on a small scale, though quite sufficient for the requirements of the visitors, and will no doubt assume larger proportions as the place developes.

I cannot close this small work without expressing my thanks to Dr. Barraduc, the Medical Inspector at Chatel-Guyon, to whom I am indebted for a great deal of information contained in this memoir and whom I have always found most courteous and attentive to his colleagues and to his patients.



The Paris Lyons and Mediterranean Railway Line .